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पर्यावरण अवस्थाओं का वर्गीकरण

भाग 2 प्रकृति में दिखाई देने वाली पर्यावरण अवस्थायें

अनुभाग 3 वायु दाब

Indian Standard

CLASSIFICATION OF ENVIRONMENTAL CONDITIONS

PART 2 ENVIRONMENTAL CONDITIONS APPEARING IN NATURE

Section 3 Air Pressure

UDC 621·38·038 : 620·193 : 620·162·4

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BUREAU OF INDIAN STANDARDS
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Price Group 1

Environmental Testing Procedures Sectional Committee, LT 02

NATIONAL FOREWORD

This Indian Standard, which is identical with IEC Pub 721-2-3 (1987) 'Classification of environmental conditions — Part 2 : Environmental conditions appearing in nature. Air pressure', issued by the International Electrotechnical Commission, was adopted by the Bureau of Indian Standards on the recommendation of the Environmental Testing Procedures Sectional Committee (LT 02) and approval of the Electronics and Telecommunication Division Council.

The text of the IEC standard has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

> Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

The concerned technical committee has reviewed the provisions of IEC 721-1 (1981) and ISO 2533 (1975), referred in this standard and has decided that they are acceptable for use in conjunction with this standard.

Part 1 of this Indian Standard deals with classification of environmental parameters and their severities. The subsequent parts are intended to deal with the following:

a) Environmental conditions appearing in nature.
b) Classification of groups of environmental parameters and their severities.

Only the English language text in the International Standard has been retained while adopting it in this Indian Standard.

IS 13736 (Part 2/Sec 3) : 1993
IEC Pub 721-2-3 (1987)

Indian Standard

CLASSIFICATION OF ENVIRONMENTAL CONDITIONS

PART 2 ENVIRONMENTAL CONDITIONS APPEARING IN NATURE

Section 3 Air Pressure

1. Scope

This part of the standard presents a selection of different values of air pressure appearing in nature. It is intended to be used as part of the background material when selecting appropriate severities of air pressure for product applications.

When selecting severities of the parameter air pressure for product applications, the values given in IEC Publication 721-1 should be applied.

2. Object

To indicate values of air pressure to which products are liable to be exposed during storage, transportation and use.

3. General

Air pressure can affect products in various ways, the most important of which are as follows:

3.1 *Air pressure lower than normal*

Low air pressure occurring at altitudes above sea-level can affect products as follows:

- leakage of gases or fluids from gasket-sealed containers,
- rupture of pressurized containers,
- change of physical and chemical properties of low density materials,
- erratic operation or malfunction of equipment from arcing or corona as the breakdown voltage between two electrodes in air decreases with pressure (the breakdown voltage of air in a uniform electric field depends on the product of the gas pressure and the electrode spacing for a given electrode shape and material (Paschen's law)),

decreased efficiency of heat dissipation by convection and conduction in air, affecting equipment cooling (for the case of a box-shaped object dissipating heat to the surrounding air, having dimensions in the range of 100 mm to 200 mm and a surface emissivity coefficient of 0.7, a decrease of 30% in air pressure corresponding to an altitude of 3 000 m above sea-level has been found to cause an increase of 12% in temperature rise. Other shapes, especially finned structures, and other surfaces, especially polished metals, could show a considerably higher increase in temperature), acceleration of effects due essentially to temperature, for example volatilization of plasticizers, evaporation of lubricants, etc.

3.2 *Air pressure higher than normal*

High air pressure occurring in natural depressions and mines can have a mechanical effect on sealed containers.

4. Values of air pressure

The normal value of air pressure at mean sea-level is 101.325 kPa. Depending on meteorological conditions, air pressure at sea-level may vary from approximately 91% to 107% of the aforementioned value. Similar values of variation occur at altitudes above and below sea-level.

In areas above sea-level air pressure is lower than at sea-level, in areas below sea-level (natural depressions and mines) higher than at sea-level.

In the following Table I standard values of air pressure in round figures are given for different altitudes.

TABLE I

Normal air pressure related to altitudes above and below sea-level

Altitude (m)		Air pressure (kPa)
30 000		1.2
25 000		2.5
20 000		5.5
15 000		12.0
10 000		26.4
8 000		35.6
6 000		47.2
5 000		54.0
4 000		61.6
3 000		70.1
2 000		79.5
1 000		89.9
0	sea-level	101.3
- 400		106.2
- 1 000		113.9
- 2 000		127.8

Notes *1.-* Values corresponding to the highest altitudes are given to take into account meteorological observation units and transportation by air.

2.- The altitude -400 m corresponds to the deepest natural depression in the world.

3.- For further information see ISO Standard 2533.

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